

4.15 SHORELINES

Eastern portions of the harbor are composed of fine-grained sand beaches, exposed riprap structures, scarps, steep slopes of sand, and salt and brackish water marshes along the shoreline near Sullivans Island. Historic Fort Sumter has exposed rip rap along the southern, eastern, and northern portions of the island and salt and brackish water marsh along the western side of the island. Northward along the eastern shoreline and including the Town of Mount Pleasant, the habitats are dominated by salt and brackish water marshes. The shoreline of Shutes Folly is salt and brackish water marshes along the northern, eastern, and western sides of the island. The southern shoreline of Shutes Folly is exposed tidal flats. The shoreline of Crab Bank is salt and brackish water marshes along the eastern side of the island and fine grained sand beach and exposed scarp in clay along the western side of the island. A small area at the tip of Patriots Point has fine-grained sand beaches and along the Wando Terminal there is a solid man-made structure. The eastern shoreline habitats of the Wando River north of the Wando Terminal are salt and brackish water marshes.

As shown in [Figure 4.15-1](#), shoreline habitats along Daniel Island from the Cainhoy portion of the Wando River southward across from the Wando Terminal are mainly salt and brackish water marshes with exposed tidal flats (sandy) and portions of gravel (shell) beaches. On Daniel Island, southward to the estuary, are exposed riprap structures. Northward on Daniel Island, along the Cooper River, are salt and brackish water marshes.

Charleston Harbor, along the western shoreline, is primarily salt and brackish water marshes with a few areas classified as fine grained sand beaches and gravel (shell) beaches closer to the Atlantic Ocean.

From the Cooper River Shoreline (West) and west side of Charleston Harbor from the southern portion of the Cooper River and Ashley Rivers near the mouth of the harbor northward towards the tip of the City of Charleston, Union Terminal, Columbus Street Terminal, the shorelines are dominated by sheltered, solid man-made structures. Drum Island's shoreline is classified as salt and brackish water marsh and exposed tidal flats along the eastern side of the island, gravel (shell) beaches on the northern side of the island, and exposed tidal flats and fine grained sand beach on the southwestern portion of the island. Northward, towards the Naval Base (not including Shipyard Creek), are salt and brackish-water marshes. Shipyard Creek contains solid man-made structures and riprap along the western portion of the creek and salt and brackish water marshes along the eastern portion of the creek to the former Naval Base. The former Naval Base's shoreline habitat is solid man-made structures. Exposed walls and other structures made of concrete, wood, or metal and salt and brackish-water marshes make-up the shoreline habitat further north.

[Appendix 4.15-1](#) contains a 1997 report from the USACE Waterways Experiment Station, "Shoreline Conditions near Hobcaw Point, Wando River, Charleston Harbor, Charleston, South Carolina," which assessed the effects of the channel and vessels traversing the channel on the shoreline and near-shore sediment conditions near Hobcaw Point. Procedures used include reconnaissance of sediment conditions in 1992 and 1997, measuring of water depths, bed sediments, shoreline areas, collection of water samples, wave height data, and observations of large cargo ships both inbound and outbound. The report indicated there is no evidence of gross erosion in the shallow area off Hobcaw Point or along the shoreline. Compared to restricted waterways where vessel waves and draw down strongly impact the shoreline, this area is relatively natural. The most severe vessel waves observed were generated by passing tug boats

and service craft. While no erosion was observed, it is possible that some vessel passages might produce erosion. The sea level is rising on a global basis at about 0.0062 feet/year based on records from 1890 to 1980. From 1979 to 1997, the average sea level at Charleston has risen about 0.1948 feet or 2.33 inches. Given the relative shear stresses developed by vessel and wind waves, wind wave erosion was the most likely process involved in potential shoreline erosion in Charleston Harbor.

Conclusions show that shoreline and shallow water depth contours between Remley Point and the Wando Terminal have moved landward by perhaps an average of 1.4 feet per year over the period 1979 to 1997. Diking, construction of the Wando Channel, and rediversion of the Cooper River have each affected channel cross-sections, and may continue to do so for years before an equilibrium is established. Waves produced by container vessels do not appear to be as important as wind waves or even as waves produced by smaller displacement waves in generating shear stress forces on the sediment bed. Vessel waves are solitary and infrequent in comparison to wind waves. Sea level rising in the harbor also contributes to land loss along the shoreline.

The existing Wando River Lower Reach is approximately 6,500 feet long and 500 feet away from the shorelines of Remley Point and Hobcaw Point. Marine cargo ships, tug boats, and pleasure boats using this portion of the channel produce waves that reach the shoreline. In addition, the heavy discharge of the Cooper River affects the shoreline of the Wando River Lower Reach. There are various factors that can affect the shoreline and specifying one as the cause would be inaccurate. Wind-waves, vessels, and a rising sea level all contribute a part in the erosion of shorelines of the Charleston Harbor, Cooper River, and Wando River.